WHAT IS CLAIMED IS:

1. A brushless DC motor, comprising;

a rotor assembly including a rotatable shaft having a permanent magnet affixed to the shaft;

a plurality of coils for producing a magnetic field for applying a torque to the rotor assembly, said coils including end turns that enclose the rotor assembly such that the rotor assembly is not removable; and

a stator stack made of a stator magnetic material for providing a magnetic flux return path.

2. The DC motor of Claim 1 further comprising a winding form being configured to receive the plurality of coils.

3. The DC motor of Claim 2 wherein the winding form further includes a tube, a plurality of teeth, and an end plug.

4. The DC motor of Claim 3 wherein the tube, end plug, and teeth are made from a molded plastic.

5. The DC motor of Claim 1 wherein the coils are wound in a three phase winding configuration selected from the group of: delta configuration and wye configuration.

6. The DC motor of Claim 5 wherein the coils are connected in the delta configuration.

7. The DC motor of Claim 1 wherein the coils are layer wound.

8. The DC motor of Claim 1 wherein the stator magnetic material is a laminated silicon steel.

9. The DC motor of Claim 1 further comprising a position sensor system selected from the group comprised of: Hall effect sensors and leakage flux sensors.

10. The DC motor of Claim 1 wherein the permanent magnet is magnetized after the plurality of coils are wound.

11. A brushless DC motor, comprising:

a rotor assembly including a rotatable shaft and a permanent magnet affixed to the shaft, said permanent magnet for generating a magnetic field;

a winding form enclosing the rotor assembly;

a plurality of coils wound upon the winding form for producing a magnetic field for applying a torque to the rotor assembly, said coils including end turns that enclose the rotor assembly such that the rotor assembly is not removable, wherein said coils are connected in a three phase delta configuration having a positional relationship with the permanent magnet;

a stator stack made of a stator magnetic material for providing a magnetic flux return path for the magnetic field of the permanent magnet;

a position sensor system for sensing the positional relationship that the coils have with the permanent magnet; and

a controller coupled to the position sensor for controlling the application of a power source to the coils in response to the positional relationship of the coils and the permanent magnet.

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12. The DC motor of Claim 11 wherein the stator magnetic material is a laminated silicon steel.

13. The DC motor of Claim 11 wherein the position sensor system is selected from the group comprised of: Hall effect sensors and leakage flux sensors.

14. A cordless power tool, comprising;

a power module for supplying electrical energy to the brushless DC motor;

a brushless DC motor for converting electrical energy to mechanical energy, including;

a rotor assembly having a rotatable shaft and a permanent magnet affixed to the shaft, said permanent magnet for generating a magnetic field;

a winding form enclosing the rotor assembly;

a plurality of coils wound upon the winding form for producing a magnetic field for applying a torque to the rotor assembly, said coils including end turns that enclose the rotor assembly such that the rotor assembly is not removable, wherein said coils are connected in a three phase delta configuration;

a stator stack made of a stator magnetic material for providing a magnetic flux return path for the permanent magnet magnetic field;

a position sensor system for sensing the positional relationship between the permanent magnet and the plurality of coils; and

a controller, responsive to said position sensor, for controlling the supply of power to the brushless DC motor; and

a tool interface for interfacing the DC motor with a tool; and

a housing for enclosing the power module, controller and DC motor.

15. The cordless power tool of Claim 14 further comprising a gear train coupled from the DC motor to the tool interface.

16. The cordless power tool of Claim 14 wherein the DC motor further comprising a winding form being configured to receive the plurality of coils.

17. The cordless power tool of Claim 16 wherein the winding form further includes a tube, a plurality of teeth, and an end plug.

18. The cordless power tool of Claim 17 wherein the tube, end plug and the teeth are made from a molded plastic.

19. The cordless power tool of Claim 14 wherein the coils are wound in a three phase winding configuration selected from the group of: delta configuration and wye configuration.

20. The cordless power tool of Claim 19 wherein the coils are connected in the delta configuration.

21. The cordless power tool of Claim 14 wherein the coils are layer wound.

22. The cordless power tool of Claim 14 wherein the stator magnetic material is a laminated steel.

23. The cordless power tool of Claim 14 further comprising a position sensor selected from the group comprised of: Hall effect sensors and leakage flux sensors.

24. A method of constructing a brushless DC motor, comprising the steps of:

providing magnetizable material to be used in the formation of a permanent magnet;

bonding the magnetizable material to a rotatable shaft, whereby a rotor is assembled;

winding a plurality of coils about the rotor such that an air gap is maintained between the coils and the rotor; and

providing a magnetic flux return path for magnetic flux that flows from the rotor.

25. The method of Claim 24 further comprising the step of magnetizing the magnetizable material such that a permanent magnet is formed, wherein the step of magnetizing occurs after the step of winding the plurality of coils is completed.

26. The method of Claim 24 wherein the coils include end turns that enclose the rotor such that the rotor is not removable.

27. The method of Claim 24 further comprising the step of connecting the coils in a three phase delta configuration, whereby the coils have a positional relationship with the magnetizable material.

28. The method of Claim 25 further comprising the steps of:

providing a flow of power to the windings such that a magnetic field is generated;

sensing the positional relationship between the permanent magnet and the plurality of coils; and

controlling the flow of power to the windings in response to the sensed positional relationship.

29. The method of Claim 24 wherein the step of winding further comprises the steps of:

providing a winding form that encircles the rotor; and

winding the plurality of coils about the winding form.

30. A DC power tool comprising:

a housing defining an interface for mechanically and electrically mating with a power module;

a brushless DC motor operable in a preselected voltage range to convert electrical power to mechanical power, the brushless DC motor comprising;

a rotor assembly including a rotatable shaft and a permanent magnet affixed to the shaft;

a slotless wound stator including a winding form that encircles the rotor assembly such that an air gap is maintained between the winding form and the rotor assembly, and a plurality of coils for producing a magnetic field for applying a torque to the rotor assembly, said coils being wound about an outer surface of the winding form; and

a stator stack made of a stator magnetic material for providing a magnetic flux return path; and

a power supply module mechanically and electrically configured to connect to a source of electric power and to mate with the low-voltage DC power tool, said power supply module being adapted to provide a DC voltage in the preselected voltage range suitable for powering the low-voltage DC power tool.

31. The DC power tool of Claim 30 wherein the power supply module is a cordless battery power module mechanically and electrically configured to mate with the DC power tool and to contain a battery assembly having a DC voltage in the preselected voltage range suitable for powering the DC power tool, said battery power module to provide power from the battery assembly to the DC power tool.

32. The DC power tool of Claim 30 wherein the power supply module is a corded line power module mechanically and electrically configured to mate with the DC power tool and being adapted to convert electric power from the source of electric power to a DC voltage in the preselected voltage range suitable for powering the low-voltage DC power tool.

33. The DC power tool of Claim 30 wherein the coils include end turns that enclose the rotor assembly such that the rotor assembly is not removable.

34. The DC power tool of Claim 33 wherein the winding form further includes a tube, a plurality of teeth, and an end plug.

35. The DC power tool of Claim 34 wherein the tube, end plug, and teeth are made from a molded plastic.

36. The DC power tool of Claim 30 wherein the coils are wound in a three phase winding configuration selected from the group of: delta configuration and wye configuration.

37. The DC power tool of Claim 36 wherein the coils are connected in the delta configuration.

38. The DC power tool of Claim 36 wherein the coils are layer wound.

39. The DC power tool of Claim 30 further comprising a controller for controlling the application of electrical power to the brushless DC motor.

40. A brushless DC motor, comprising;

a rotor assembly including a rotatable shaft having a permanent magnet affixed to the shaft;

an encapsulated stator defining an interface with the rotor assembly such that an air gap is formed; the stator comprising;

a plurality of coils for producing a magnetic field to apply a torque to the rotor assembly; and

a stator stack made of a stator magnetic material for providing a magnetic flux return path; and

a seal applied to the interface being adapted to seal the air gap such that the air gap is blocked off.

41. The DC motor of Claim 40 wherein the encapsulated stator further includes a winding form that encircles the rotor assembly such that an air gap is maintained between the winding form and the rotor assembly, the winding form being configured to receive the plurality of coils.

42. The DC motor of Claim 41 wherein the winding form further includes a tube, a plurality of teeth, and an end plug.

43. The DC motor of Claim 42 wherein the tube, end plug, and teeth are made from a molded plastic.

44. The DC motor of Claim 42 further comprising an end bell affixed to the stator being adapted to support the rotor assembly such that the air gap is maintained.

45. The DC motor of Claim 44 wherein the seal is adapted to contact the end plug and the end bell, thereby blocking off the air gap.

46. The DC motor of Claim 40 wherein the seal is formed from a compliant material.

47. The DC motor of Claim 40 wherein said coils include end turns that enclose the rotor assembly such that the rotor assembly is not removable

48. The DC motor of Claim 47 wherein the coils are wound in a three phase winding configuration selected from the group of: delta configuration and wye configuration.

49. The DC motor of Claim 48 wherein the coils are connected in the delta configuration.

50. A method of constructing a brushless DC motor, comprising the steps of:

bonding a permanent magnet to a rotatable shaft, whereby a rotor is assembled;

winding a plurality of coils about the rotor such that an interface is defined having an air gap formed between the coils and the rotor;

retaining the rotor substantially concentric to the plurality of coils such that the air gap is maintained;

applying a seal to the interface such that the air gap is sealed; and

applying an impregnation resin to the coils, wherein an encapsulated stator is formed.

51. The method of Claim 50 further comprising the step of encircling the coils and rotor with a magnetic flux return path for magnetic flux that flows from the rotor;

52. The method of Claim 51 wherein the magnetic flux return path is a stator stack.

53. The method of Claim 50 further comprising the step of connecting the coils in a three phase delta configuration, whereby the coils have a positional relationship with the permanent magnet.

54. The method of Claim 53 further comprising the steps of:

providing a flow of power to the windings such that a magnetic field is generated;

sensing the positional relationship between the permanent magnet and the plurality of coils; and

controlling the flow of power to the windings in response to the sensed positional relationship.

55. The method of Claim 53 wherein the step of winding further comprises the steps of:

providing a winding form that encircles the rotor; and

winding the plurality of coils about the winding form.